1017-7

MODERN ASPHALT FOR INDUSTRIAL FLOORING

INDUSTRIAL ASPHALTS DIVISION • THE FLINTKOTE COMPANY

MODERN ASPHALT FOR INDUSTRIAL FLOORING

THE FLINTKOTE COMPANY
INDUSTRIAL ASPHALTS DIVISION

NEW YORK • CHICAGO • DETROIT • BOSTON
NEW ORLEANS • ATLANTA • CINCINNATI

INDEX

I

INTRODUCTORY REVIEW

Worn out floors present one of the more serious and recurring problems in the operation and maintenance of Industrial Plants. Most industrial floors are subjected to heavy traffic over their wood or concrete surfaces. These rigid surfaces disintegrate rapidly under the abrasive and shock action of industrial traffic and make frequent repairs a costly item.

THE OLD FASHIONED PRACTICE

Repairs to either wood or concrete floors formerly meant expensive Replacement. In the case of wood floors, worn out boards would be taken up and new boards nailed in place.

When repairing concrete floors, whole areas would be chipped out to the required depth and fresh concrete fill poured and finished.

In either case this old fashioned procedure was in reality a gradual replacement of the original floor base at the same high initial cost ... and with no assurance of longer life than that inherent in the original material.

THE MODERN PRACTICE SAVES TIME AND EXPENSE

To do away with this need for constant reinvestment and also to protect the original investment in Industrial Flooring, an asphaltic protective coating seemed to offer the solution to the problem.

The use of protective coatings was already an established practice ... in Industrial Roofing to protect the initial investment against the destructive action of the elements. Similarly, in the Engineering and Construction fields, protective coatings were widely used to protect structures against corrosive action.

Based on this background of experience, the Flintkote Company pioneered the development of a protective coating for Industrial Floors that provides a wearing surface that does not form an integral part of the structure of the building. Furthermore, this Flintkote protective surfacing is resilient and consequently absorbs the disintegrating effects of traffic in much the same manner as a relatively inexpensive bearing absorbs the wear and tear of an expensive machine.

In road traffic the problem of shock absorption has been solved by the automobile manufacturer with spring suspension, pneumatic tires, "knee action" and "floating power." In industrial traffic the most practical and economical solution to this problem of traffic shock absorption lies not in the vehicle itself but in the surfacing over which the vehicle passes:—namely, the flooring. Thus this new type of protective floor surfacing, with its shock absorption qualities, helped solve one of Industry's most perplexing problems.

ASPHALT . . . THE RIGHT MATERIAL

Flintkote, in developing this new floor surfacing, had to solve several basic problems: namely ... finding the right material or materials to meet in a practical way the conditions of application and service. Economy, naturally, was also an important objective.

Asphalt proved, after extensive research, to be the ideal material. Asphalt combines all the important properties such as hardness, resiliency, malleability and masticity that are essential for high shock absorption. It is an excellent binder for mineral aggregate and it is inexpensive.

ADAPTATION OF ASPHALT TO INDUSTRIAL USES

Asphalt, in its adaptation to Industrial uses, has gone through various progressive steps. It is commercially available in three different forms: [1] In its natural or primary form (hot asphalt). [2] In the form of solutions (cut-

back asphalts). [3] In the form of dispersions (asphalt emulsions). In each of these three progressive phases asphalt has been applied to Industrial Flooring as follows:

HOT MASTICS

The first system was based on the use of Asphalt in its natural or solid form. This method entailed the melting of asphalt in kettles and the adding of fine mineral filler and aggregate. This hot mastic mix was then laid on the floor base in thicknesses of 1″ to 2″.

There were many drawbacks to this method. Some of the more important were:

The use of heating equipment frequently proved cumbersome and impractical.

There was a distinct fire hazard.

The properties of the asphalt might be damaged by overheating.

A poor bond might be obtained if the asphalt were underheated.

It is impractical to lay this type of mastic in thicknesses of less than one inch.

And finally, the finished mastic tends to roll or wave, resulting in unevenness and roughness.

CUT-BACK ASPHALT

Asphalt in solution or "cut-back" form is not practical for use in Industrial Flooring. It is limited as to types and quantites of aggregate with which it can be mixed, and because of slow drying has to be applied in a number of successive layers, with long drying out periods in between.

COLD MASTIC . . . THE MODERN PRACTICE

Asphalt mastic surfacing, laid cold through the use of Industrial Asphalt Emulsion* with its improved properties both in the material itself and in the method of its handling and application, has provided the solution to the problem that for so long made Industrial Flooring maintenance an unnecessarily expensive burden on Industry.

The interesting story of the practical adaptation of asphalt in its Modern form to Industrial Flooring is outlined in the next few pages.

WHAT IS INDUSTRIAL ASPHALT EMULSION?

Flintkote Industrial Asphalt Emulsion is a mechanical mixture of finely subdivided particles of asphalt floating in water. A third element, usually termed the emulsifying agent, is incorporated in order to keep the asphalt particles in uniform suspension and to prevent their coalescing while in the liquid state.

When exposed to the air, the water evaporates, allowing the asphalt particles to run together into a continuous film in which the original properties of the asphalt have been unimpaired. Further, the *patented* Flintkote process of emulsification gives to the deposited asphalt beneficial properties (such as non-flow under heat) not originally inherent in it. A dried film of Flintkote Asphalt Emulsion contains plus or minus 98% of pure bitumen.

**The term "Industrial Asphalt Emulsion" is used in this booklet to denote that type of emulsified asphalt which is "stable" and best adapted to use in Industry. There are other types of asphalt emulsions which, while satisfactory in their proper fields (such as road building) are not appropriate for industrial use, and the reader should be guided accordingly.*

The Flintkote Company is not only the originator of "stable" industrial asphalt emulsions, which are manufactured by its own patented process, but has pioneered the development of modern asphalt in industry.

WHAT ARE ITS PROPERTIES?

Asphalt in emulsion form is handled cold, and does away with the objections and risks of heating or of the use of solvents.

It can be diluted with water.

It can be mixed with cement and aggregates.

It ensures uniform distribution of the asphalt with the aggregate.

It is stable and does not flow under heat.

It is economical.

WHAT IS ITS SCOPE IN THE INDUSTRIAL FLOORING FIELD?

Flintkote Industrial Asphalt Emulsion, in the form of mastic mixes, finds its place in three phases of Industrial Flooring problems:

(**A**) Patching

(**B**) Trucking Surfaces

(**C**) Complete Floor Resurfacing

While the objective has been the same in each of these three uses, the problems involved vary greatly and have required a considerable amount of study and progressive development.

(A) PATCHING

Floor patching by its very nature limits the application of mastics to small areas and necessitates relatively *wet* mixes for easy laying by hand trowelling. One of the early drawbacks faced in asphalt emulsion mastics was their tendency to crack, due mainly to excessive and too rapid shrinkage which was the natural result to be expected because of evaporation of the proportionately high water content.

In patching work, however, this objectionable feature did not make itself particularly evident, and was outweighed by the ease of application right over the existing base, and by the possibility of feather-edging the mastic down to the existing floor level. In this phase, cement—emulsion—sand mixes are generally employed.

(B) TRUCKING SURFACES

The next step involves the laying of relatively larger areas in such places where the resilient and shock-absorbing properties of the mastic are most needed; that is, where trucking is heaviest. Here again hand trowelling is the method used. In this case, however, it was found practicable and advisable to incorporate mineral aggregate, resulting in cement — emulsion — sand — stone mixes. There were three factors in this type of work which minimized the tendency of the mastics to crack.

(**1**) The increase in the mineral content of the mixes automatically reduced the percentage of water which had to evaporate.

(**2**) The relatively larger areas involved made retardation of drying such as is common in curing cement an established practice.

(**3**) Due to the mastic nature of the mix, the kneading action of trucking ensured the ironing out and healing of any setting cracks that developed.

At this stage of development it became evident that the action of traffic was most beneficial and these mastics began to be designated as "Heavy-Duty" Mastic Flooring. The claim was made that the greater the traffic the better the floor surfacing. While this may have sounded like sales talk, it was in fact a very essential requirement to the success of the application.

(C) COMPLETE FLOOR RESURFACING

The excellent and proven qualities of cold mastics laid with Flintkote Asphalt Emulsion naturally led to greater interest on the part of

Plant Engineers in this type of floor surfacing, not only for maintenance work but also for new construction.

This entailed the laying of complete floors, certain areas of which would not necessarily be subjected to the beneficial action of trucking. The problem of initial cracking and also the necessity of shortening the time before the floor could be put into service gained added prominence. It was evident that the use of mixes having greater percentages of aggregate and, as a consequence, a far lower percentage of water content, would be highly desirable. The development of these "dry" mixes presented the further problem of the inability to lay such mixes by hand trowelling methods. Further research and practical field work have now lead to the introduction of the first *machine-laid* cold mastic floors. This practical innovation has ensured the adoption of Flintkote asphalt mastics as standard practice in industrial maintenance and new construction. Below are listed some of the advantages that have made this possible:

Quicker and easier laying, with consequent saving in time and labor.

Floor ready for use in shorter time.

Ensures practical optimum cement/water ratio. (The water content, expressed as a percentage of the wet batch, has been reduced from 22% in the original type mixes to 9% in the new extended aggregate mixes).

Greater densification of floor, ensuring easier trucking from the time the floor is put into service.

Ensures greater economy of installation, maintenance, and plant operation.

In addition to the foregoing advantages, the properties of the asphalt inherent in Flintkote Asphalt Emulsion give to this type of Industrial Floor Surfacing the following characteristics:

Greater waterproofness

Resistance to the action of chemicals

Less fatiguing to standing operators . . . a mastic and warmer surface

Noise deadening

Dustless

▼ ▼ ▼

NOTE: *For further general information on the adaptation of asphalt to Industry see our booklet:* "An Introduction to Industrial Asphalt Products." *A free copy will be sent on request.*

II

INDUSTRIAL PRACTICE

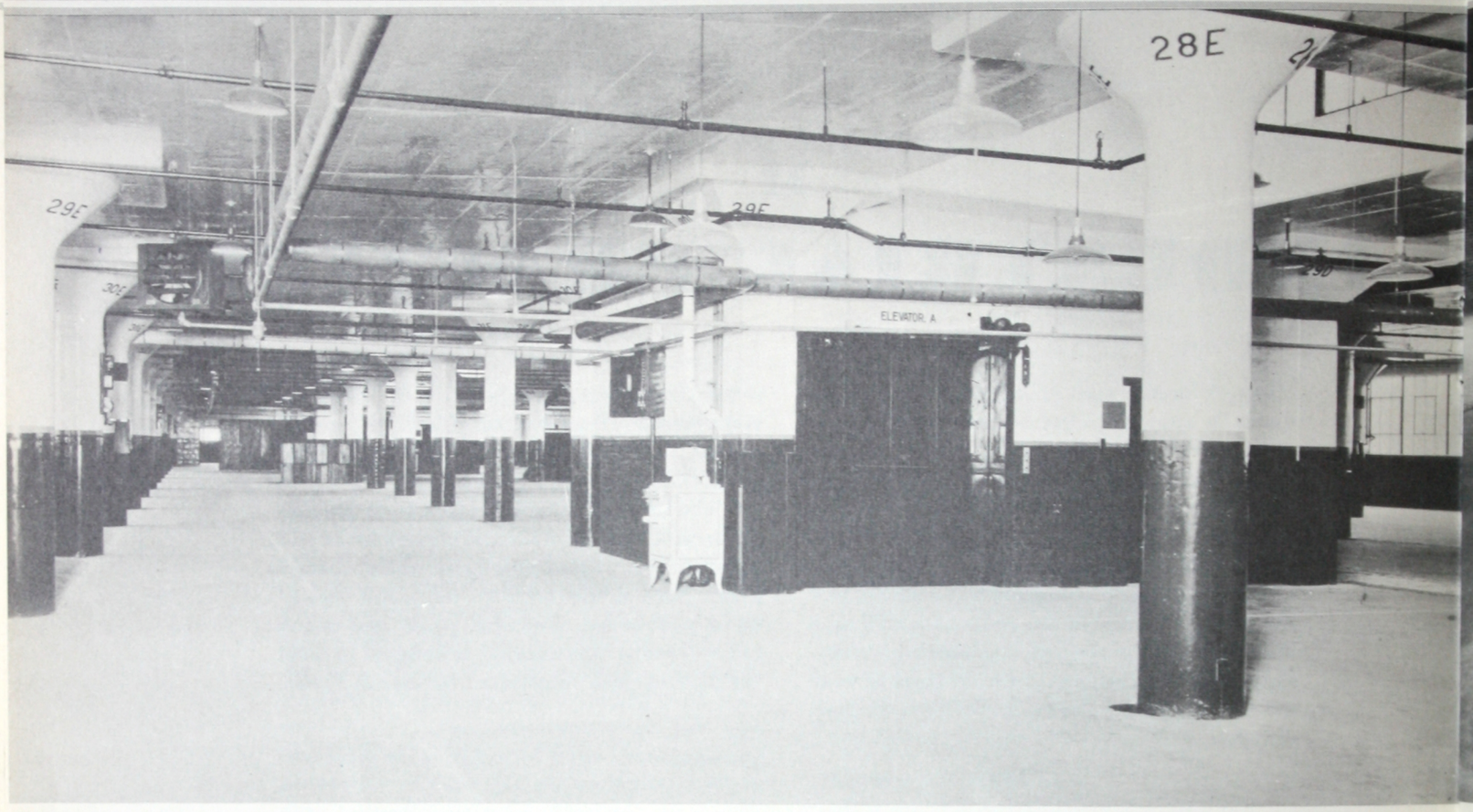
Many different types of industries have been quick to appreciate the advantages of heavy-duty Mastic Flooring made with Flintkote Emulsified Asphalt. On the following pages, actual photographs show the wide variety of modern plants which have availed themselves of this new, improved flooring.

The progressive manufacturer realizes that the savings effected by the reduced installation and maintenance costs of machine laid heavy-duty Mastic Flooring . . . the savings due to reduction of wear and tear on his trucking equipment . . . the savings due to extra years of service . . . are all items that eventually show up on the profit side of his ledger.

When the need is for a durable floor, capable of carrying greater point and moving loads and permitting increased density of traffic . . . steel plant, automobile factory, telegraph equipment warehouse, chemical plant and many others, choose this flooring developed to meet the most exigent demands of Industrial Traffic.

This trucking aisle is only part of a total of 50,000 square feet of resurfacing done by a large manufacturer of office equipment. Heavy-duty Mastic Flooring made with Flintkote Emulsified Asphalt was used throughout.

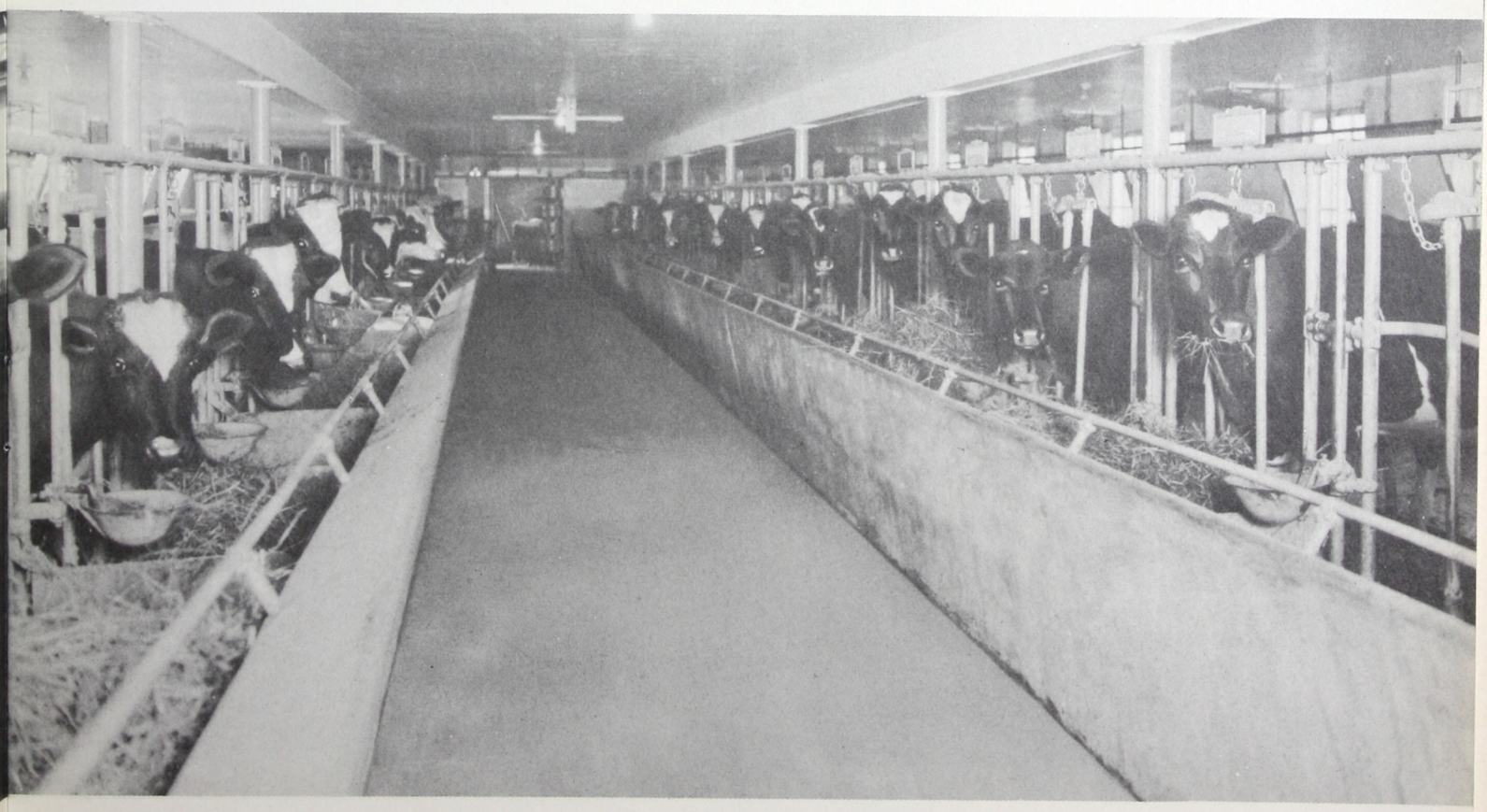
MODERN ASPHALT FOR INDUSTRIAL FLOORING



Heavy-duty Mastic Flooring with Flintkote Asphalt Emulsion has been laid over the entire floor area in this warehouse of a telegraph company for maximum durability under heavy traffic conditions.

Heavy-duty Mastic Flooring with Flintkote Asphalt Emulsion was specified when this new unit in a steel plant was designed, as offering the most suitable wearing surface under toughest traffic conditions.

A manufacturer of automobiles has chosen Heavy-duty Mastic Flooring made with Flintkote Emulsified Asphalt to give service under the most severe conditions.



Another unique use for Flintkote Mastic assures a sturdy but soft-textured surface in this modern dairy.

MODERN ASPHALT FOR INDUSTRIAL FLOORING

Heavy-duty Mastic Flooring made with Flintkote Emulsified Asphalt makes a rugged, tough, wear-resisting floor in subway cars.

This ramp surfaced with heavy-duty Mastic Flooring made with Flintkote Emulsified Asphalt will continue to withstand years of hard wear.

III

SPECIFICATIONS

THIS SECTION IS DEVOTED TO "PRODUCT" AND "APPLICATION" SPECIFICATIONS AS FOLLOWS:

PRODUCT: Flintkote N-13-F Asphalt Emulsion

APPLICATION: Floor Patching
Heavy Duty Mastic (Hand Application)
Heavy Duty Mastic (Machine Application)

▼ ▼ ▼

PRODUCT

N-13-F

THE ASPHALT EMULSION SHALL HAVE THE FOLLOWING PROPERTIES:

1. The emulsion shall comprise asphalt dispersed in water by means of a mineral colloid.

2. The emulsion shall be uniform in character and shall remain in suspension without settling or packing in the container.

3. When 5 grams of the emulsion is diluted with equal quantities of water and there is added 5 cc. of 10% solution of sulphuric acid or 1 gram of hydrated lime the emulsion shall be sufficiently stable so that it will not break.

4. The emulsion shall be spread upon a steel plate to an approximate wet thickness of 3/32″ and the film shall be allowed to dry at room temperature for 48 hours. The film so prepared shall not melt and flow off the slide when the flame of a Bunsen Burner is directed against the back of the plate, and as the action of the flame is continued, the mass of the film shall char in place.

5. The emulsion shall have an asphalt content of not less than 53% by weight, and shall contain not more than 2% of ash. The water content shall not exceed 40% and the emulsion shall contain not less than 4.5% or more than 5.5% of wool fibre.

▼ ▼ ▼

NOTE: *The specification of the asphalt shall be as follows:*

DUCTILITY 100 CM PLUS
PENETRATION 50/60
MELT POINT 125/135° F.

These characteristics are NOT *subject to test* AFTER *emulsification but are certified by The Flintkote Company.*

1 REPAIRING THE SURFACE

Holes like this one can be patched. This condition is typical of many floors that have been allowed to disintegrate. Flintkote N-13-F Flooring Emulsion offers an economical material for repairing worn out floors. *Clean* hole and surface around hole *thoroughly*. Remove all dust, dirt or foreign material with stiff broom. Oil or grease should be removed with good caustic cleaner.

Scrub hole and surrounding surface with cold water. Leave surface damp but not wet.

2 PRIMING THE SURFACE

Now apply a prime or bond coat of STATIC Protective Coating (C-13-HPC). This should be done preferably in two applications. The first coat should be diluted 50% with cold water and this wash coat well scrubbed into the surface.

The second coat can be diluted 10% and applied at the rate of one gallon per 100 square feet of surface. Allow this to dry until surface becomes tacky. Bond coat should be extended several inches out on to floor proper, beyond edge of patch.

3 PREPARING THE MASTIC MIXTURE

Thoroughly mix the *carefully* measured quantities of sand and dry cement in the proportions specified below. Sprinkle with sufficient water to mix to a heavy mortar.

Add water a little at a time to avoid over-wetting the mortar, resulting in a sloppy mix.

4 MIXTURE

1 Volume of Portland Cement

2 Volumes of N-13-F Flooring Emulsion

3½ Volumes of clean, sharp sand

To the cement-sand mortar add N-13-F Flooring Emulsion and work until entire mastic is of uniform black color.

Your trucking aisles and entire floor areas can be re-sur
Specifications, in detail, on the follo

MIXING MASTIC

5

Best results are obtained by keeping the mastic mix of the heaviest or stiffest consistency that will be workable. Avoid sloppy mixes.

Mastic should be mixed until of uniform color. No light streaks should appear. When of uniform color, mastic is then ready for application.

PLACING THE MASTIC

6

Fill hole with mastic mixture in such manner as to leave no voids, etc. Fill holes to $\frac{1}{16}$ to $\frac{1}{8}$" above surrounding floor level to allow for shrinkage.

Note how the bond coat extends beyond the edge of the hole. Note also the consistency of the mastic. It is easily worked in place with a trowel.

TROWELING

7

Extend mastic mix to featheredge on primed surface around hole. Mastic should not be in contact with any part of the surface which has not been primed.

The featheredge of the mastic should now be painted with STATIC Protective Coating (C-13-HPC) to seal the edges of the patch. Patch should now be kept out of service for 24 hours and the drying should be retarded by covering with waterproof or wet papers.

PATCHING COMPLETED

8

The floor is now ready for easier trucking of heavier loads with less wear and tear on trucking equipment. Thousands of satisfied users in leading industrial plants find this quick and convenient method of floor patching reduces maintenance costs.

floor areas can be re-surfaced in this simple manner —
, in detail, on the following pages.

THE FLINTKOTE COMPANY · INDUSTRIAL ASPHALTS DIVISION · 50 WEST 50TH STREET, NEW YORK, N. Y.

SPECIFICATIONS

HEAVY DUTY

INDUSTRIAL ASPHALT MASTIC FLOORING

I.

HAND APPLICATION

Floors installed under these specifications are rugged, tough, industrial floors, and are kept in best condition by continuous traffic. Although being sufficiently hard, they have remarkable malleable properties, so that traffic marks produced in service are ironed out through self-healing properties of the floor under constant use.

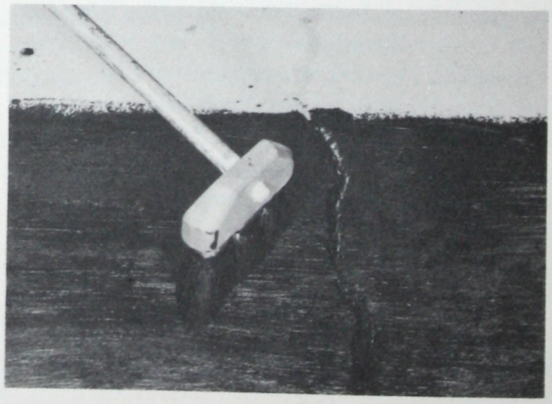
SPECIFICATIONS FOR INSTALLING ASPHALT MASTIC FLOORING MADE WITH FLINTKOTE FIBRATED ASPHALT EMULSION N-13-F — HAND FLOATED

PREPARATION OF BASE: The surface of the base to be covered should be cleaned of all grease, dirt, or foreign matter by the proper use of water, lye, gasoline, etc., and washed with water.

Where the floor contains ruts, depressions, or holes too shallow for leveling with concrete, these should be first brought to the level of the base by applying the mastic mixture on primer to the desired areas.

These are allowed to set before the application of the primer and the surfacing layer, so that the surface coat may be applied in substantially uniform thickness.

PRIMING: While the base is still wet or damp, a coating of C-13-HPC, diluted not more than 20% with clean, cool water, should be scrubbed over the surface filling all depressions, using about 1 to 1½ gallons of undiluted material in either one or two coats for each 100 square feet of surface and allow to dry. To enhance the mechanical bond, a priming mixture composed of one part by volume of coarse sand to one part of C-13-HPC can be applied with a stiff broom in place of the C-13-HPC Primer.



Bonding or prime coat of C-13-HPC over concrete, wood, or metal.

624 SOUTH MICHIGAN AVE., CHICAGO • 826 PARK SQUARE BUILDING, BOSTON
1215 SYLVAN ROAD, S.W., ATLANTA • POLAND AND GALVEZ STS., NEW ORLEANS
74th and LEBANON STS., CINCINNATI • 14201 SCHAEFER HIGHWAY, DETROIT

Mixing cement and aggregate prior to adding the Asphalt Emulsion.

After cement and aggregate have been mixed with enough water to make workable, Flintkote Asphalt Emulsion is added COLD.

PREPARATION OF MASTIC MIXTURE

First thoroughly mix the measured quantities of dry cement and aggregate in the proportions to follow. Sprinkle this dry mix with water sufficient to facilitate mixing to a heavy mortar. To this mortar add N-13-F Emulsion and work until entire mastic is of uniform black color. The mastic should not be sloppy before being applied, but should be of heavy consistency suitable for good working conditions.

MIXTURE NO. 1

HEAVY DUTY FLOOR: This mixture is recommended as most suitable for usual conditions. Prepare this mix by volume:

1 volume of Portland cement
2 volumes of N-13-F Emulsion
2 volumes of sand
3 volumes of gravel or broken stone

The following quantities will cover 120-130 square feet, one-half inch thick:

1 bag of Portland cement (1 cu. ft.)
15 gals. of N-13-F Emulsion
2 cu. ft. of sand
3 cu. ft. of crushed rock or gravel

MIXTURE NO. 2

HEAVY DUTY FLOOR: This mixture may be advantageously used where large aggregate is not available or where material is to be brought to a feather edge as in leveling, etc. Prepare this mix by volume:

1 volume of Portland cement
2 volumes of N-13-F Emulsion
3½ volumes of sand

The following materials will be necessary for each 100 square feet of surface one-half inch thick:

1 bag Portland cement (1 cu. ft.)
15 gals. N-13-F Emulsion
3½ cu. ft. sand

TOOLS AND EQUIPMENT FOR HAND MIXING

Mixing box, two hoes, shovel, two 5 gallon pails, wood float, steel trowel, straight edge for leveling mastic, one-half inch strips with beveled edge for depth control, wheel barrow or buckets for carrying mix, brooms, brush, chalk line, level, etc.

CONCRETE MIXER: When obtainable, a batch rotating drum type mixer can be used. In preparing mixture in a concrete mixer, follow the same general procedure as above for hand mixing. Do not run the mixer too long or the bitumen may strip from the aggregate. For a one cubic yard batch about four to five minutes after addition of emulsion will be sufficient.

SAND: Sand suitable for well graded concrete is the type required. Do not use plastering sand nor sand showing indications of chemical decay. The sand should be free from quicksand, clay, loam, mica, sticks, organic matter, and other impurities, and may be moist but not wet.

GRAVEL: Stone, granite chips, etc. $\frac{1}{8}$" to $\frac{3}{8}$" in size. Crushed aggregate with sharp angular edges is preferable.

LAYING: A finished thickness of $\frac{1}{2}$" is recommended. Screed strips of the desired thickness should be prepared and conveniently placed on the floor. After the mastic mix has been roughly placed on the floor, a straight edged striking-off board is then laid across screeds to level up. The floor may be wood floated to remove rough spots, preferably after initial set has taken place.

The cold mastic mix ready for laying.

"Initial set" under average conditions occurs within four to five hours after installation of mastic, while final set is obtained in about twelve hours. A steel trowel can be used beneficially to give slight compression and a smooth finish.

ROLLING: After steel trowelling, and before mastic is thoroughly dry, a roller should be used. This roller should weigh 10 pounds per inch of width (usually 300 pound water-filled hand roller, 30 inches wide, is used) and should be applied as soon as the flooring has attained sufficient strength so as not to pick up or slough the mastic. The mixture should be sufficiently hard so that no footprints following the roller shall be left in the mastic. Over-rolling is not desirable and rolling should be postponed if undue softening or picking up of the mastic is evidenced.

CURING: Precaution should be taken to retard drying on all areas, especially those subjected to accelerated drying conditions (heat or air currents) such as open windows, vents, elevator landings, etc. After steel trowelling, the surface should be sprinkled and kept wet for at least 24 hours. Paper sacks, and other moisture-retarding media may be applied to assist in retardation of drying. Note should be made of the fact the longer the mastic is retarded the greater its strength and the less likely it is to develop "star cracks" which indicate too rapid drying, resulting in rapid contraction.

FLOOR PATCHING: Mastic patching is prepared to same specifications as show for Mixtures No. 1 and No. 2. Clean out hole or rut of loose particles, dirt, and grease; trim edges to a shoulder; scrub with broom wet with water and apply a priming coat of diluted C-13-HPC, to entire surface, as well as 4 inches on floor around outer edge. When priming coat has dried, trowel in mastic, feathering off on primed surface of floor. Allow 1/16 inch above level for shrinkage.

PREPARATION OF BASE OVER WOOD FLOORING: It is possible to apply asphalt mastic flooring over old wood floors, but the results will naturally depend upon the condition of the foundation afforded to the mastic. Do not attempt to apply mastic resurfacing to wood floors that obviously need replacing because of rotted condition, or to floors suffering from physical defects. Floors that are in sound condition can, however, be surfaced with mastic in the following manner:

Replace worn or rotted boards; nail down all loose boards. Apply C-13-HPC at the rate of 2 gallons per 100 square feet, and allow to dry. Place on this priming coat expanded metal diamond reinforcing 3.4 pounds in weight per square yard, and nail to wood base every 4 inches each way with roofing nails, lapping sheets of lath at least 1 inch. A second priming coat should be given to the metal lath. Flooring is laid in usual manner, but should cover top of lath at least $\frac{3}{8}$ inch.

Metal lath used for reinforcing flooring mastic over wood base.

PRECAUTIONS: When not in use, keep tools and brushes in water to avoid gumming. Mastic flooring must not be laid in freezing weather or when the temperature is likely to drop below freezing before the floor has had time to set. Emulsion must not be stored in a place where the temperature will drop below freezing point.

UNDER THE FOLLOWING CONDITIONS THE FOREGOING SPECIFICATIONS DO NOT APPLY:

1. Where floors are subjected to heavy traffic with constant water present.

2. Areas where complete and thorough drying is questionable, or where traffic will be present before material is in condition to withstand it.

3. Installations at, or so near, freezing temperatures that a normal temperature drop will freeze the mix before setting.

4. All areas where fats, oils or grease will be on the floor. This does not apply to occasional fats or oils.

5. Where subject to sugar or sugar solutions, unless base be cleaned free of all sugars and completely dry before sugar in the form of dust or in solution comes in contact with the mastic. Sugar stops cement from setting.

6. Chemical plants, dairies, tanneries, rayon plants, etc., where acid solutions come in contact with the floor. Special recommendations will, however, be given for unusual conditions where standard specifications do not apply. Write to our nearest Sales Office, giving complete information.

SPECIFICATIONS

HEAVY DUTY

INDUSTRIAL ASPHALT MASTIC FLOORING

II.

MACHINE APPLICATION

Where traffic conditions are such that harder floors are required than those installed by hand methods, the use of mechanical equipment (Electric Mastic Power Float) for finishing asphalt mastic flooring is recommended. Floors installed under this specification are capable of withstanding heavier moving and point loads because of the densifying and compacting action of the Mastic Power Float. Traffic action is transmitted to the foundation by direct contact between the large particles of aggregate, because voids in the aggregate are not overfilled by mortar constituent.

The Mastic Power Float permits the use of drier mixes, resulting in more rapid drying of the mastic floor. Traffic, therefore, can be admitted in less time.

These specially constructed Electric Mastic Power Floats can be obtained from The Flintkote Company through exclusive arrangements with the manufacturer. When ordering machines please specify power characteristics.

SPECIFICATIONS FOR INSTALLING ASPHALT MASTIC FLOORING MADE WITH FLINTKOTE FIBRATED ASPHALT EMULSION N-13-F—POWER FLOATED

PREPARATION OF BASE: The surface of the base to be covered should be cleaned of all grease, dirt, or foreign matter by the proper use of water, lye, gasoline, etc., and washed with water. A rotating wire scrub brush can be furnished for use with the Power Float. This machine affords an economical and convenient method of preparing the surface.

Deep holes should first be brought up to level by filling with concrete. Depressions and ruts not over 2 inches deep can be satisfactorily taken care of at the time mastic finish is applied.

PRIMING: While the base is still wet or damp, a coating of C-13-HPC, diluted not more than 20% with clean, cool water, should be scrubbed over the surface filling all depressions, using about 1 to 1½ gallons of undiluted material in either one or two coats for each 100 square feet of surface, and allow to dry. To enhance the mechanical bond, a priming mixture composed of one part by volume of coarse sand to one part of C-13-HPC can be applied with a stiff broom in place of the C-13-HPC Primer.

PREPARATION OF MASTIC MIXTURE

First thoroughly mix the measured quantities of dry cement and aggregate in the proportions to follow. Sprinkle this dry mix with water, the quantity depending upon the nature and moisture content of the aggregate. With aggregate which is not dry, an average of 3 to 4 gallons of water per sack of cement will generally suffice. To this mortar add measured volume of N-13-F Flooring Emulsion and work until entire mastic is of uniform black color. It is important that the finished mix be of the heaviest consistency possible. The mastic, when worked into a ball between palms, should barely stick together and should show a small amount of moisture which can be patted to the surface of the ball. If the standard A.S.T.M. slump tester be employed, the slump should not exceed ½ inch.

MIXTURE

HEAVY DUTY FLOOR: Prepare this mix by volume:

1 volume Portland Cement
2 volumes N-13-F Emulsion
2 volumes Torpedo Sand
6 volumes Gravel or Stone Chips

The following quantities on the average will cover 170-175 square feet, ½ inch thick:

1 bag Portland Cement (1 cu. ft.)
15 gals. N-13-F Emulsion
2 cu. ft. Sand (15 gals.)
6 cu. ft. Gravel or Stone Chips (45 gals.)

TOOLS AND EQUIPMENT REQUIRED: Mastic Power Float, two hoes, shovel, two 5 gallon pails, rakes having short tines, a steel trowel, straight edge about five feet long for leveling mastic, one-half inch strips with beveled edge for depth control, wood float, pointed trowel, open face tamper, wheelbarrow or buckets for carrying mix, brooms, brush, chalk line, level, etc.

MECHANICAL MIXER: Either a batch rotating drum type concrete mixer or a mortar type mixer (stationary tilting open top drum with revolving blades) is recommended for all dry mix work because of the difficulty of mixing mastic sufficiently stiff by hand methods. In preparing mixture in mechanical mixers, follow the same general procedure as above. Do not run the mixer too long as the bitumen may strip from the aggregate. For one cubic yard batch about four to five minutes after addition of emulsion will be sufficient.

SAND: Sand suitable for well graded concrete is the type required. Do not use plastering sand nor sand showing indications of chemical decay. The sand should be free from quicksand, clay, loam, mica, sticks, organic matter, and other impurities, and may be moist but not wet.

GRAVEL: Stone, granite chips, etc. ⅛″ to ⅜″ in size. Crushed aggregate with sharp angular edges is preferable.

LAYING: A finished thickness of ½″ is recommended. Screed strips or wood blocks about 2″ square of the desired thickness should be prepared and conveniently placed on the floor about ten feet apart. The dry nature of the mastic will make placing by the usual sawing-off method difficult. Dry mix mastic is best raked into place with a rake having short or cut-off tines. Rake mastic slightly above finished floor level.

Note the dry Asphalt Mastic mix being tamped in place before Power Floating.

The Electric Power Float is easily operated and cuts application costs.

TAMPING: A tamper is then employed to densify the mix. Use a perforated tamper made of perforated steel plate or of heavy wire mesh (½″). This will prevent mixture from sticking to the tamper. Rolling with a water filled garden roller of 300 to 500 pounds may be substituted for tamping if desired.

SCRAPING TO LEVEL: It is important to obtain a level surface for the floating machine. A scraper about 5 feet long, slightly beveled on the bottom and having a steel face is used for this operation. Scrape down to level established by screed strips, using a sideways or scythe motion. Screed strips may then be removed and space filled with mastic immediately.

POWER FLOATING: If mastic has been mixed to the correct consistency the floating operation can immediately follow the scraping operation. If too much water has been inadvertently used, it will be necessary to wait until the mastic stiffens before floating (see PREPARATION OF MASTIC). Mastic may be judged ready for floating when it will bear the full weight of a man without appreciable indentation or heel marks.

A finisher can become skilled in the operation of the floating machine in a short time. A slight raising or lowering of the handle causes the machine to travel to the left or right. Complete instructions are furnished with the machine.

A given area need only be floated until sufficient mortar has been worked to the surface to fill all voids, etc.

A second floating with the machine can be given about one-half to one hour after first floating. This will further densify and compact the floor.

STEEL TROWELING: The floated floor may be given a light steel troweling once over immediately following the float.

CURING: Too rapid drying will result in slight checking or cracking. As soon as floor is sufficiently hard to resist marking, it should be sprinkled with water and kept wet for at least 12 hours. Wet sacks, wet sawdust, paper or other suitable curing methods may be employed if desired.

PREPARATION OF BASE OVER WOOD FLOORING: It is possible to apply asphalt mastic flooring over old wood floors, but the results will naturally depend upon the condition of the foundation afforded to the mastic. Do not attempt to apply mastic resurfacing to wood floors that obviously need replacing because of rotted condition, or to floors suffering from physical defects. Floors that are in sound condition can, however, be surfaced with mastic in the following manner:

Replace worn or rotted boards; nail down all loose boards. Apply C-13-HPC at the rate of 2 gallons per 100 square feet, and allow to dry. Place on this priming coat expanded metal diamond reinforcing 3.4 pounds in weight per square yard, and nail to wood base every 4 inches each way with roofing nails, lapping sheets of lath at least 1 inch. A second priming coat should be given to the metal lath. Flooring is laid in usual manner, but should cover top of lath at least $\frac{3}{8}$ inch.

PRECAUTIONS: When not in use, keep tools and brushes in water to avoid gumming. Mastic flooring must not be laid in freezing weather or when the temperature is likely to drop below freezing before the floor has had time to set. Emulsion must not be stored in a place where the temperature will drop below freezing point.

UNDER THE FOLLOWING CONDITIONS THE FOREGOING SPECIFICATIONS DO NOT APPLY:

1. Where floors are subjected to heavy traffic with constant water present.

2. Areas where complete and thorough drying is questionable, or where traffic will be present before material is in condition to withstand it.

3. Installations at, or so near, freezing temperatures that a normal temperature drop will freeze the mix before setting.

4. All areas where fats, oils or grease will be on the floor. This does not apply to occasional fats or oils.

5. Where subject to sugar or sugar solutions, unless base be cleaned free of all sugars and completely dry before sugar in the form of dust or in solution comes in contact with the mastic. Sugar stops cement from setting.

6. Chemical plants, dairies, tanneries, rayon plants, dye works, fruit canning plants, etc., where acid solutions come in contact with the floor. Special recommendations will, however, be given for unusual conditions where standard specifications do not apply. Write to our nearest Sales Office, giving complete information.

Products Distributed by

INDUSTRIAL ASPHALTS DIVISION
THE FLINTKOTE COMPANY

50 West 50th Street, New York, N. Y.

ASPHALT EMULSIONS

Protective Coatings
Roof Coatings
Mastic Flooring Emulsions
Insulation Protection
Industrial Soap Emulsions
Floor Tile Cements
Emulsified Asphalt Specialties

ASPHALT CUTBACKS

Asphalt Primer
Asphalt Roof Coating
Plastic Cement
Cutback Asphalt Specialties

ASPHALT SATURATED FABRIC

Light Weight Saturated Fabric
12 Oz. A.S.T.M. Fabric
Heavy-Duty Saturated Fabric
Roof Tape

ASPHALT PLANK

Waterproof Protection Course
Bridge Surfacing
Industrial Flooring

SALES OFFICES
OF
THE FLINTKOTE COMPANY

NEW YORK . . . . . 50 West 50th Street
ATLANTA . . . . 1215 Sylvan Road, S. W.
BOSTON . . . . . 826 Park Square Building
CHICAGO . . . 624 South Michigan Avenue
CINCINNATI . . . 74th and Lebanon Streets
DETROIT . . . . 14201 Schaefer Highway
NEW ORLEANS . . Poland and Galvez Streets

PIONEER-FLINTKOTE COMPANY
Los Angeles . 55th and Alameda Sts.

INDUSTRIAL ASPHALTS COMPANY, Ltd.
London, E.C. 3 . 31 Great St. Helens

Lithographed in U. S. A.
National Process Company, New York, N. Y.


FLINTKOTE
PROTECTION